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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,335	08/26/2003	Frieder Borgmeier	241974US0	3547

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
JOHNSON, CHRISTINA ANN	
ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/647,335	BORGMEIER ET AL.	
	Examiner	Art Unit	
	Christina Johnson	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☒ Claim(s) *7-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 7-11 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 7-11 have not been further treated on the merits.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bogan, Jr. '173 in view of any of: Hinago et al. or Chaturvedi et al. '136 or Chaturvedi et al. '907 or Chaturvedi et al. '280 or Chaturvedi et al. '031 or Bogan, Jr. '978 or Chaturvedi et al. '525.

Bogan, Jr. (US 6,642,173) discloses a mixed metal oxide catalyst having the formula $A_aV_bN_xO_e$ wherein A is at least one element selected from the group consisting of Mo and W, N is at least one element selected from the group consisting of Te, Se, and Sb, X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga,

Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I, wherein A, V, N and X are present in such amounts that the atomic ratio of A:V:N:X is a:b:c:d, and wherein, when a=1, b=0.1 to 2, c=0.1 to 1, d=0.01 to 1 and e is dependent on the oxidation state of the other elements, may be improved for the oxidation (in the case where N is at least one element selected from the group consisting of Te, Se and Sb) of an alkane, or a mixture of an alkane and an alkene, to an unsaturated carboxylic acid or may be improved for the ammoxidation (in the case where N is at least one element selected from the group consisting of Te and Se) of an alkane, or a mixture of an alkane and an alkene, to an unsaturated nitrile, by contacting the mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide (column 3, lines 23-60).

The reference teaches that the catalyst is prepared by providing a mixed metal oxide having the above formula, contacting said mixed metal oxide with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids, and hydrogen peroxide, and recovering the metal oxide to obtain a catalyst (column 4, lines 1-20). Suitable inorganic acids include nitric acid (column 8, lines 45-55). The reference does not detail that the precursor materials are washed with any liquids (column 9, lines 40-65).

The difference between the reference and the claims is that the reference does not specifically disclose that the mixed metal oxide includes metal M^3 required by the claims, although the Bogan, Jr. catalyst is open to other elements (refer to "at least one" language recited throughout).

Hinago et al. (US 6,610,629) discloses a metal oxide comprising Mo, V, Sb and/or Te, and Nb and which may further include an element Z, i.e. at least one element selected from the group consisting of tungsten, chromium, titanium, aluminum, tantalum, zirconium, hafnium, manganese, rhenium, iron, ruthenium, cobalt, rhodium, nickel, palladium, platinum, zinc, boron, gallium, indium, germanium, tin, phosphorus, lead, bismuth, yttrium, rare earth elements, and alkaline earth metals (column 6, lines 15-40). It is taught that the catalyst is employed in the oxidation or ammoxidation of propane or isobutene (Abstract).

Chaturvedi et al. (US 6,734,136) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and Ir and/or Sm (column 4, lines 20-30). The reference teaches that the addition of Ir and/or Sm provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 15-22). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,589,907) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and Ga and/or Zn (column 4, lines 20-40). The reference teaches that the addition of Ga and/or zinc provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 15-22). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,407,280) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and an element Z

selected from the group consisting of Ni, Pd, Cu, Ag, and Au (column 4, lines 40-55). The reference teaches that the addition of element Z provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 30-40). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,407,031) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and an element Z selected from the group consisting of Sc, Y, Pr, Nd, and Tb (column 4, lines 45-60). The reference teaches that the addition of the element Z provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 10-22). The catalyst is useful in the oxidation of an alkane (Abstract).

Bogan, Jr. (US 6,383,978) discloses a mixed metal oxide catalyst comprising Mo, V, Te, Sb, and/or Se, Nb, and the element Z selected from the group consisting of Se and Bi (column 3, lines 30-55). The reference teaches that the addition of Ga and/or zinc provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 3, lines 20-30). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,403,525) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and In and/or Re (column 4, lines 15-35). The reference teaches that the addition of In and/or Re provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 10-15). The catalyst is useful in the oxidation of an alkane (Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the composition and method of Bogan, Jr. '173 to include the use of any of the metal promoters taught by the secondary references, which would meet the required M^3. One would have been motivated to do so in light of the teachings by the secondary references the use of such additional metals are conventional in the art and result in a catalyst having increased selectivity and higher yields of the desired reaction products. Because all of the catalysts taught by the prior art are useful in the same process of use, one would have a reasonable expectation of success from the combination.

With respect to the XRD pattern required by the instant claims, it is the position of the examiner that because the combined teachings of the prior art teach the same composition made by the same process, the XRD pattern of the product produced would necessarily be the same.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/06199 in view of any of: Hinago et al. or Chaturvedi et al. '136 or Chaturvedi et al. '907 or Chaturvedi et al. '280 or Chaturvedi et al. '031 or Bogan, Jr. '978 or Chaturvedi et al. '525.

WO 02/06199 discloses a mixed metal oxide having the formula $Mo_1V_bM_c^1M_d^2O_n$ where M^1 is Te and/or Sb, M^2 is at least one of the elements from the group consisting of Nb, Ta, W, Ti, Al, Zr, Cr, Mn, Ga, Fe, Ru, Co, Rh, Ni, Pd, Pt, La, Bi, B, Ce, Sn, Zn, Si

and In, b is from 0.01 to 1, c is from greater than 0 to 1, preferably from 0.01 to 1, d is greater than 0 to 1, preferably from 0.01 to 1, and n is a number which is determined by the valency and frequency of the elements other than oxygen in (I), whose X-ray diffraction pattern has reflections h, i and k whose peaks are at the diffraction angles (2.theta.) 22.2.+/-.0.4.degree (h), 27.3.+/-.0.4.degree (i), and 28.2.+/-.0.4.degree (k), the reflection h being the most intense reflection within the X-ray diffraction pattern and having a half-width of not more than 0.5.degree., the intensity P_i of the reflection i anD the intensity P_k of the reflection k fulfilling the relationship $0.65 \leq R \leq 0.85$, where R is the intensity ratio defined by the formula $R=P_i/(P_i+P_k)$ the half-width of the reflection i and that of the reflection k each being ≤1.degree., wherein the at least one mixed metal oxide material (I) is one whose X-ray diffraction pattern has no reflection with the peak position 2.theta.=50.0.+/-.0.3.degree., i.e. is one which contains no k-phase, and the preparation of which does not require the concomitant use of 30% by weight, based on its mass, of silica sol (page 4, line 35 – page 5, line 45).

The WO reference teaches that the mixed metal oxide material is prepared by preparing an oxide material having the above mentioned forumula, followed by washing with liquids such as organic acids, inorganic acids such as nitric acid, alcohols and hydrogen peroxide (page 6, line 45 – page 7, line 15). The reference does not detail that the precursor materials are washed with any liquids.

The difference between the reference and the claims is that the reference does not specifically disclose that the mixed metal oxide includes metal M^3 required by the

claims, although the WO reference catalyst is open to other elements (refer to "at least one" language recited throughout).

Hinago et al. (US 6,610,629) discloses a metal oxide comprising Mo, V, Sb and/or Te, and Nb and which may further include an element Z, i.e. at least one element selected from the group consisting of tungsten, chromium, titanium, aluminum, tantalum, zirconium, hafnium, manganese, rhenium, iron, ruthenium, cobalt, rhodium, nickel, palladium, platinum, zinc, boron, gallium, indium, germanium, tin, phosphorus, lead, bismuth, yttrium, rare earth elements, and alkaline earth metals (column 6, lines 15-40). It is taught that the catalyst is employed in the oxidation or ammoxidation of propane or isobutene (Abstract).

Chaturvedi et al. (US 6,734,136) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and Ir and/or Sm (column 4, lines 20-30). The reference teaches that the addition of Ir and/or Sm provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 15-22). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,589,907) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and Ga and/or Zn (column 4, lines 20-40). The reference teaches that the addition of Ga and/or zinc provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 15-22). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,407,280) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and an element Z selected from the group consisting of Ni, Pd, Cu, Ag, and Au (column 4, lines 40-55). The reference teaches that the addition of element Z provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 30-40). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,407,031) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and an element Z selected from the group consisting of Sc, Y, Pr, Nd, and Tb (column 4, lines 45-60). The reference teaches that the addition of the element Z provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 4, lines 10-22). The catalyst is useful in the oxidation of an alkane (Abstract).

Bogan, Jr. (US 6,383,978) discloses a mixed metal oxide catalyst comprising Mo, V, Te, Sb, and/or Se, Nb, and the element Z selected from the group consisting of Se and Bi (column 3, lines 30-55). The reference teaches that the addition of Ga and/or zinc provides a catalyst with increased selectivity which results in greater yields of the desired reaction product (column 3, lines 20-30). The catalyst is useful in the oxidation of an alkane (Abstract).

Chaturvedi et al. (US 6,403,525) discloses a mixed metal oxide catalyst comprising Mo and/or W, V and/or Ce, Te, Sb, and/or Se, Nb, and In and/or Re (column 4, lines 15-35). The reference teaches that the addition of In and/or Re provides a catalyst with increased selectivity which results in greater yields of the desired reaction

product (column 4, lines 10-15). The catalyst is useful in the oxidation of an alkane (Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the composition and method of the WO reference to include the use of any of the metal promoters taught by the secondary references, which would meet the required M^3. One would have been motivated to do so in light of the teachings by the secondary references the use of such additional metals are conventional in the art and result in a catalyst having increased selectivity and higher yields of the desired reaction products. Because all of the catalysts taught by the prior art are useful in the same process of use, one would have a reasonable expectation of success from the combination.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Johnson whose telephone number is (571) 272-1176. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Johnson
Patent Examiner
Art Unit 1725
3/15/05

CAJ
March 15, 2005